

NAVAL MEDICAL RESEARCH AND DEVELOPMENT NEWS

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Jointness Across Navy Medicine

By Vice Adm. Matthew L. Nathan,
U.S. Navy surgeon general and chief,
U.S. Navy Bureau of Medicine and
Surgery

FALLS CHURCH, Va. - Jointness is paramount as we move toward a more collaborative and plugged-in world across the Military Health System. By partnering with our sister services and other federal health care institutions, non-governmental organizations, the private sector and our academic partners, we are becoming stronger. We're building a better team together using the synergy of each of our strengths. This jointness is also pivotal to value and readiness in the care we provide and the way we execute our mission.

Whether you are a Navy researcher attached to one of our Naval Medical Research Units around the world, a corpsman in school at the Medical Education and Training Campus at Fort Sam Houston, or an orthopedic surgeon at Walter Reed



Vice Adm. Matthew L. Nathan

National Military Medical Center, your job influences all Services. I would like to focus this month on the many partnerships across the enterprise in areas such as research and develop-
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Remembering Our Deployed Warfighters

Please keep our deployed warfighters in mind.

Cmdr. James Lawler of NMRC's Biological Defense Research Directorate is currently serving as the head of the Austere Environments Consortium for Enhanced Sepsis Outcomes (ACESO).

Lt. Cmdr. Rachel Lee is a research physician assigned to NHRC.

Lt. Cmdr. Marvin Sklar is a clinical/research investigator in NMRC's Viral Diseases Department.

Lt. Cmdr. James Tuberson is NAMRU-Dayton's Director for Administration.

Lt. Erica Harris is a research psychologist at NHRC.
All are deployed in Afghanistan.



NMRC Commanding Officer's Message



Many significant events are impacting the Navy Medicine R&D Enterprise. The political unrest in Cairo, sequestration, and the 2013 furloughs that began in July for our civilian employees are having an effect on the research we do for the warfighter. We are all faced with personal and professional challenges as we move forward as a team to meet our research goals. We are also part of the transition to the Defense Health Agency (DHA), which will officially stand up October 1, 2013, and is scheduled for full operating capability within two years. The shared services that will be aligned under the DHA: Medical Logistics, Medical Facilities, TRICARE Health Plan, Health Information Technology, Public Health, Pharmacy, Acquisition, Medical Research and Development, Medical Education and Training, and Budget. The specific functions that will be aligned within the DHA are being evaluated by the many working groups and subject matter experts engaged in the transition activities, and will be determined by the ASD(HA) in close consultation with the Surgeons General. We are faced with additional challenges in FY 2014 with budget reductions and potential personnel decisions.

Given these serious issues, I have to say I am impressed with the continued dedication and focus of our researchers and all those who support them. Thank you for your continued patience and support as we work together during these uncertain times and continue to navigate through these rough waters. I will keep you informed every step of the way, and the leadership team is available to answer any questions or address any concerns.

NMRC Commanding Officer sends,
John W. Sanders III, CAPT, MC, USN



NSMRL Commanding Officer's Message

Greetings from the Submarine Capital of the World! NSMRL remains poised amid two attack submarine squadrons, Submarine Group TWO and the Submarine Learning Center/Submarine School in Groton, Conn. We were recently visited by VADM Connor, the Submarine Force Commander, who expressed great interest in the many ongoing research projects in support of the Submarine Force. In 2011, Submarine Force leadership created *The Design for Undersea Warfare* and *Undersea Warfighting*, providing guidance to the Fleet with a framework for action while defining the way forward in a recognized complex and often unpredictable environment. Over the past year, NSMRL aligned research efforts with these documents. Our success is marked through direct ties with *The Design's* Lines of Effort in provision of *actionable* operational research solutions with speedy transition to the fleet.

NSMRL is at the forefront of fundamental changes in submarine operations that have been in place for the past 44 years. Limitations in qualified personnel and operational considerations led to the traditional 6 hours on/12 hours off 3-section underway submarine watch rotation schedule. Recent advancements in test equipment and cultural shifts in the submarine community allowed our Submarine Medicine Department to open doors to significant findings regarding submarine watch schedules and circadian physiology. NSMRL was able to provide landmark guidance to enact 24-hour scheduling in the Submarine Force. In doing so, circadian rhythm entrainment is achieved along with enhanced watchstanding performance, improved sleep (quantity and quality), and minimization of fatigue and associated mishaps. VADM Connor provided a strong endorsement via Personal For message to his submarine commanders to embrace and implement the change.

On the horizon is another major shift, this time in the personnel selection process. Currently non-nuclear submariners are psychologically screened upon arrival at the Basic Enlisted Submarine School (BESS). NSMRL research validated testing between submariners at Recruit Training Command and at BESS. This will allow the shift of testing to RTC – earlier in the training pipeline. By identifying and screening submariners who do not have the psychological aptitude for submarine service earlier in the accession pipeline, the Submarine Force Personnel Directorate estimates a savings of \$9.7 million annually. That's a quick look at two hot submarine solutions at the tip of the NSMRL spear!

NSMRL Commanding Officer sends,
Steven M. Wechsler, CAPT, MC, USN

Partnership Demonstrates Vaccine Protects Against Malaria

From Naval Medical Research Center Public Affairs

SILVER SPRING, Md. - Researchers from the Naval Medical Research Center (NMRC) and other federal and industry partners published the results of a successful clinical trial of a new malaria vaccine, August 8.

NMRC researchers played a key role in the design of the study, particularly in testing the efficacy of the vaccine by exposure to infectious mosquitoes and in the volunteer follow-up.

"The work done by researchers at the Naval Medical Research Center and their colleagues represents a big step forward for malaria vaccine research," said Vice Adm. Matthew L. Nathan, Navy Surgeon General and chief, Bureau of Medicine and Surgery. "Navy Medicine researchers began working on this vaccine in the early 1970s with unwavering commitment. Their efforts have been instrumental to this study."

This is the first time that 100 percent protective efficacy has been achieved in any clinical trial testing a candidate malaria vaccine.

"Our NMRC researchers are dedicated to conducting medical research to enhance deployment readiness of DoD personnel worldwide and to protect our warfighters in harm's way," said Nathan.

The vaccine used in this clinical trial was given at varied doses by intravenous injection to 40 volunteers from October 2011 to October 2012.

Three weeks after the final immunization, volunteers were exposed to the bites of five mosquitoes carrying infectious *Plasmodium falciparum* malaria. At the highest vaccine dose, six of nine volunteers receiving four doses and six of six volunteers receiving five doses were protected against malaria infection.

"This is a historical moment in malaria vaccine research development," said Capt. Judith E. Epstein,

the NMRC lead investigator on this trial. "For the first time, we and our collaborators have a malaria vaccine approach which has demonstrated the high-level vaccine efficacy required to protect our troops. As the leader of the NMRC effort to bring this vaccine strategy to licensure, I see the U.S. Navy paving the way to a vaccine which can be used within the next three to four years for military personnel and for the millions of individuals suffering and dying from malaria worldwide."

Malaria has had a significant impact on U.S. military operations throughout history. It was responsible for a greater loss of manpower than enemy fire in all conflicts occurring in tropical regions during the 20th century.

Malaria continues to present a major challenge to force health protection during operations in any environment where malaria is endemic. This

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NAVSEA Approves Human Research Protection Program Instruction

From Department of Navy, Human Research Protection Program Update, Summer 2013

FALLS CHURCH, Va. - Vice Admiral W.H. Hilarides, commander, Naval Sea Systems Command (NAVSEA), signed the NAVSEA Headquarters Instruction 3900.12, standing up the command's Human Research Protection Program (HRPP).

NAVSEA, with a workforce of 60,000 government civilians, military personnel and contractors at 33 facilities in 16 states, manages more than 160 acquisitions programs for the Navy's surface and undersea force, including construction of all ships and submarines as well as shipboard weapons; combat systems; and hull, mechanical and electrical systems.

The instruction "establishes policy for protection of the rights and welfare of human subjects involved in research conducted or supported by NAVSEA, including NAVSEA director-

ates, staff codes, warfare centers, field activities and affiliated Program Executive Officers (PEOs)."

Dr. Robert Fagan will serve as the NAVSEA headquarters principal HRPP point of contact and Human Research Protection Official.

Several of the NAVSEA warfare centers, including the Dahlgren (Va.), Panama City (Fla.) and Carderock (Md.) divisions of the Naval Surface Warfare Center (NSWC) and the Newport (R.I.) division of the Naval Undersea Warfare Center (NUWC) as well as the Navy Experimental Diving Unit, already hold approved Assurances, maintain their own Institutional Review Boards, and have developed and approved command-level HRPP instructions.

DON HRPP Research Compliance Specialist Terrence Clemmons, who supports NAVSEA headquarters and the NSWC Dahlgren, Carderock, and Panama City divisions, says that the new NAVSEA instruction provides top-

level policy guidance for all NAVSEA commands.

It also may be used by NAVSEA warfare centers and other research sites, for example, the NSWC Crane (Ind.) division or NUWC (Keyport, Wash.), that have not established HRPPs. According to NAVSEAINST 3900.12, such commands may either establish their own IRBs or seek review of their research by means of an Institution Agreement for IRB Review by an institution holding a DoD Assurance that maintains an IRB.

The new instruction applies to "all human subject research conducted in the development, testing or evaluation of any platform, system, subsystem, component, piece of equipment or other materiel, even if a person is not the direct object of the research." It extends to all NAVSEA personnel and personnel in affiliated PEOs who participate in, conduct, support, review, approve or manage human subject research.

DoD Personnel at the Navy Laboratory in Cairo Evacuated

From NAMRU-3 Public Affairs

CAIRO - The elected president of Egypt, Mohamed Morsi, nearing the one-year anniversary of his presidency, was presented with an ultimatum by the military to form a coalition government or step down. During the period leading up to the anniversary, popular discontent with the economy and poor performance by the administration was expressed by massive demonstrations and marches throughout the country. There was also a multi-million-signature petition demanding he step down. When the president refused to meet the demands of the majority of the population, the Egyptian army responded by deposing Morsi, which was followed by an interim civilian government. Morsi's supporters reacted with massive sit-ins, demonstrations and marches throughout the city. Many have been violent, with daily disruptions.

There were concerns for the safety of both the U.S. and Egyptian staff at the U.S. Naval Medical Research Unit No. 3 ([NAMRU-3](#)). The U.S. Embassy first offered voluntary evacuation for U.S. staff and family members



NAMRU-3 staff show off their "protaches," mustaches worn in support of the return of the U.S. staff to Cairo and in hope that the political situation in Egypt will stabilize soon. Non-essential U.S. personnel were evacuated due to political unrest following Egyptian president Mohamed Morsi's deposing.

followed a few days later by an ordered evacuation of non-essential personnel.

The NAMRU-3 commanding officer, Capt. Buhari Oyofo, who experienced similar evacuations first in Indonesia and then in Cairo two-and-a-half years ago when President Mubarak was deposed, was prepared for the evacuation ordered by U.S. Ambassador Anne Patterson.

With the departure of the U.S. staff, Oyofo assigned key leadership positions to the remaining U.S. and Egyptian personnel in order to carry out the mission of NAMRU-3. At a recent Executive Steering Committee meeting, program heads reported that almost all research activities had resumed and NAMRU-3 continues to be engaged in ongoing research. Both local and evacuated staff travel to research sites in the Africa Command and European Command theaters of operation. Work with World Health Organization collaborators in the Eastern Mediterranean Region has continued without interruption. NAMRU-3 is

([Continued](#) on page 5)



"Orphans" from NAMRU-3 in the United States. Photo by David Miles, WRAIR.

NAMRU-Dayton Investigator Receives 2012 Etter Award

By Dr. Richard Arnold, NAMRU-Dayton

WRIGHT-PATTERSON AFB, Ohio - Dr. Jeffrey Phillips of the Naval Medical Research Unit Dayton ([NAMRU-Dayton](#)) recently received the Assistant Secretary of the Navy (Research, Development and Acquisition) Dr. Delores M. Etter Top Scientists and Engineers of 2012 Award in the category of Emergent Investigator. This prestigious award was created "to highlight the excellence of [the Department of the Navy's] top performing scientists and engineers."

Phillips was recognized for his outstanding applied research on the use of physiologic sensors to detect in-flight hypoxic events and for pioneering basic research in which he discovered and characterized significant delays in the recovery of certain cognitive functions after individuals experience hypoxia. In the span of a few years, Phillips has established himself as a leading DoD researcher on in-flight hypoxia detection technologies and on the effects of hypoxia on pilot performance.

At Wright-Patterson Air Force Base, Phillips serves as a key member of the U.S. Air Force team formed to address hypoxia-related issues in the F-22 Raptor. This joint collaboration between the Navy and the Air Force has benefitted USAF hypoxia detection and mitigation efforts by incorporating recommendations based on discoveries and analyses by Phillips and his team. In turn, the Navy in-flight hypoxia



Dr. Jeffrey Phillips, Naval Medical Research Unit Dayton Investigator, received the 2012 Etter Award from the Assistant Secretary of the Navy for Research, Development and Acquisition in July 2013.

detection and mitigation initiatives are benefitting directly from Phillips' research and lessons learned from initial USAF use of physiologic sensors in the F-22.

Etter Awards are traditionally presented annually at a ceremony held at the Pentagon. However, as a

result of sequestration the 2013 ceremony was cancelled.

NAMRU-Dayton's mission is to maximize warfighter performance and survivability through world-class aeromedical and environmental health research by delivering solutions to the field, the Fleet, and for the future.

DoD Personnel at the Navy Laboratory in Cairo Evacuated

(Continued from [page 4](#)) currently testing samples for MERS-CoV from the Fifth Fleet.

Even though demonstrations continue to disrupt activities throughout the country, Oyoyo has held multiple Captain's Calls to discuss issues of concern to all employees. He has exhorted the staff to do their best. However, any

employee who feels in danger by coming to work may take leave. The Embassy's Regional Security Office provides email and alerts to all employees on locations where there are ongoing or potential problems. Command leadership stresses, "Safety first!"

"We hope to get several other staff back to Cairo in the near future," said

Oyoyo. "Life can go on fairly normally for our U.S. personnel in Cairo if we follow Embassy directions and avoid certain areas."

Meanwhile, the U.S. personnel at NAMRU-3 are staging a "protache," with staff sporting mustaches in support of the return of the U.S. staff and with hopes that the political situation in Cairo will stabilize soon.

NHRC Researchers Publish in JAMA on Military Suicide Risk Factors



SILVER SPRING, Md. - Navy Medicine researchers from the Naval Health Research Center (NHRC) in San Diego published a paper on the risk factors for suicides in the U.S. military in the August 7, 2013, issue of the *Journal of the American Medical Association*. Working with collaborators from the Uniformed Services University of Health Sciences, Bethesda, Md., and the Walter Reed Army Institute of Research, Silver Spring, Md., the researchers reported findings that

do not support the assumption that specific deployment-related factors such as length of deployment, number of deployments or combat experiences are directly associated with increased suicide risk.

The study showed that the strongest risk factors for suicides include male gender and underlying mental disorders, including depression, bipolar disorder and alcohol misuse. These findings are similar to other studies involving civilian populations.

The NHRC researchers designed a study focused on the risk factors associated with suicide in current and former U.S. military members. The study

considered demographic, military, mental health, behavioral and deployment data. The study participants were current and former U.S. military personnel from all military branches, including active duty and Reserve/National Guard, who are enrolled in the Millennium Cohort Study. The Millennium Cohort Study, conducted by NHRC, began in 2001 and is the largest prospective study in the U.S. military with over 200,000 participants.

Previous military studies have relied on case reports and cross-sectional studies and have not linked data during service with post-service
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From the Navy Surgeon General: Jointness Across Navy Medicine

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ment, medical education, resource sharing and clinical informatics, among others that exemplify how we are working in a joint environment.

Nowhere is jointness more prominent than in Navy Medicine's research and development partnerships worldwide. Many Navy Medicine researchers and labs work with local ministries of health, academic partners and international health organizations around the globe to conduct lifesaving research. Navy Medicine has supported several research projects in the areas of psychological health, traumatic brain injury, suicide prevention, trauma medicine, disease surveillance, vaccine development, entomology and drug testing. Some examples include the Millennium Cohort Study, which is the largest long-term health study in U.S. military history, and the Navy Drug Testing program. The work conducted at the Navy Entomology Center of Excellence (NECE) is a great example of jointness in research and development. NECE has partnered with scientists and public health professionals from the Army and Air Force as well as the World Health Organization, U.S. Department of Agriculture and other federal agencies to develop new insecticides,

techniques and application technologies to control blood-feeding insects that transmit human disease that threaten the warfighter on the battlefield, such as malaria and dengue.

We are also seeing jointness in our education and training. A prime example of this is the state-of-the-art joint Medical Education and Training Campus (METC) at Fort Sam Houston, Texas, where our corpsmen learn alongside Air Force, Army and Coast Guard personnel. The METC offers our enlisted personnel more than 60 medical programs of instruction and boasts 24,000 annual graduates. We are very proud of the great work that is being done there.

Navy Medicine also has a robust sharing program with the various Department of Veterans Affairs hospitals and clinics. Resource sharing between Navy Medicine and VA allows for enhanced services to both DoD and VA beneficiaries while promoting cost-effective use of federal health care resources through less duplication and underuse of resources. We share services in the areas of cardiology, physical therapy, mental health, OB-GYN, surgical services, emergency services and other sub-specialty care. In addition, Navy Medicine and VA maintain

clinical research relationships to gain further understanding of deployment-related injuries and illness, PTSD, impact of various military stressors, and overall health status of active duty military, guard/reserves, retirees and other veterans.

Our clinical informatics directorate at BUMED leads the tri-service effort to standardize our Essentris Inpatient Electronic Health Records (EHR). They have been working hard to create and lead content advisory groups to best optimize and improve our inpatient Essentris EHR. Today, there are more than 900 tri-service clinicians and other key players involved in patient care who meet regularly to determine the best way to standardize Essentris inpatient content and workflows in medical treatment facilities (MTF) worldwide. As a result, our EHR now has better clinical decision support and resources, uniform workflows and potentially improves patient outcomes. Another benefit of standardization is decreased training costs. When you move to a new MTF, less orientation and training is needed because workflows are now more similar across all of our MTFs.

As I tell all who ask, we must find the efficiencies and synergies of joint
([Continued on page 10](#))

NHRC's Changes of Command - Utz to Boswell to Rychnovsky



Capt. John Sanders, commanding officer, NMRC, praises NHRC's leadership and staff during his remarks at the NMRC change of command ceremony, July 24.



Capt. Jacqueline Rychnovsky (left) and Capt. Lanny Boswell (right) cut the cake after Rychnovsky relieved Boswell of command at NHRC, July 24. Boswell assumed command upon Capt. Gregory Utz's departure.

SAN DIEGO - The Naval Health Research Center ([NHRC](#)) held two changes of command within the span of seven weeks in June and July. Capt. Gregory Utz, MC, USN, was relieved of command June 5 by NHRC's executive officer, Capt. Lanny Boswell, MSC, USN. Utz was urgently needed at his new duty station, the United States Embassy in Hanoi, Vietnam, where he will serve as the Defense Health Attaché.

"I've never enjoyed a duty station more than NHRC," Utz said during his remarks.

Utz also highlighted the successes within the Science Support Office and the enterprise SharePoint development of NHRC's Research Project Management system. Boswell promised to "keep up the momentum" generated during Utz's tenure.

NHRC was visited July 24 by Capt. John Sanders, MC, USN, commanding officer of the Naval Medical Research Center ([NMRC](#)), and Dr. Steve Walz, NMRC's director of field labs. They were joined by NHRC's prospective commanding officer, Capt. Jacqueline Rychnovsky, NC, USN, and received a full day of technical briefings from Boswell and all of NHRC's scientific departments. The group also toured the Warfighter Performance Department and the Operational Infectious Diseases laboratory facilities. At the change of command ceremony the following day, Rychnovsky relieved Boswell of command.

Boswell jokingly remarked that his command tour "was one of the shortest in Navy history, but I was happy to do it," and that he was honored to be "staying onboard as NHRC's Executive Officer, and continue to contribute to NHRC's mission dedicated to operational readiness." He also pointed out the various display tables in the reception area, which contained information on NHRC's activities for guests of the ceremonies. "We wanted to make this about NHRC's great work, and not just about me and Capt. Rychnovsky."

Sanders, the presiding official, began his remarks by praising Utz's leadership over his three-year tenure as NHRC commanding officer. "Greg was one of my very best COs, and always met each challenge with a 'can do' attitude. He often anticipated various tasks before I even presented them to him." Sanders also praised the NHRC staff, stating, "I want you to all understand how absolutely proud we are of you and the work you do. Your commitment to operational medicine and readiness is clearly evident in the research you are carrying out." Sanders also remarked that Boswell's next command tour would be a longer one.

During her remarks, Rychnovsky said that she had been honored to be selected as NHRC's new commanding officer. She was extremely impressed with the "breadth and depth of the research programs within the various departments." Rychnovsky also said, "Our command motto 'Readiness through Research and Development' says it all. It all starts with you and it's not possible without you...I look forward to telling your story. I am humbled to be your new commanding officer."

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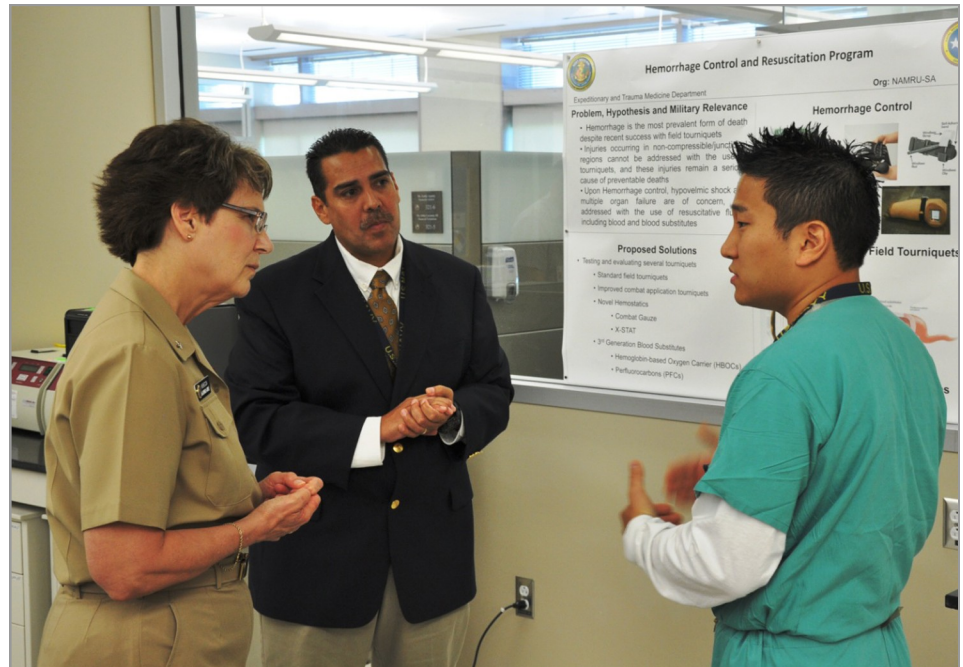
Rear Adm. Rebecca McCormick-Boyle Tours NAMRU-San Antonio

From NAMRU-San Antonio Public Affairs

SAN ANTONIO - Rear. Adm. Rebecca J. McCormick-Boyle, chief of staff, Bureau of Medicine and Surgery, visited the Naval Medical Research Unit San Antonio ([NAMRU-San Antonio](#)), June 27. NAMRU-San Antonio's commanding officer, Capt. Rita G. Simmons, and her leadership team provided McCormick-Boyle an overview of how NAMRU-San Antonio gears current research towards the critical needs and concerns of the fleet and warfighter mission.

In the Combat Casualty Care and Operational Medicine Directorate, Dr. Bjorn Song described how NAMRU-San Antonio has all the recent blood substitute products assembled in one place, where they can be evaluated using the same protocol addressing some of the current concerns regarding hypertension and vasoconstriction associated with their use. He also explained how the command has the unique ability to measure and document significant changes in vascular tone and oxygen delivery to the tissue being evaluated.

In the Craniofacial Health and Restorative Medicine Directorate, Dr. Nancy Millenbaugh presented some of NAMRU-San Antonio's latest research into an alternative to conventional antibiotics for use in treating methicillin-resistant *Staphylococcus aureus* (MRSA) maxillofacial infections. Her approach includes using gold nanoparticles along with antibodies to attach to bacteria surface molecules. The bacteria are exposed to a



Dr. Bjorn Song, research physiologist (right), and Dr. Rene Alvarez, director of Combat Casualty Care and Operational Medicine (center), provide Rear Adm. Rebecca J. McCormick-Boyle, chief of staff, Bureau of Medicine and Surgery (left) an overview of work being conducted at NAMRU-San Antonio on experimental blood substitutes.

laser pulse to destroy the bacterial cell. Results show the survivability of the bacteria is reduced to only 22 percent using this technique.

While touring NAMRU-San Antonio's facilities, Simmons explained to McCormick-Boyle the research initiatives in the areas of maxillofacial bone regeneration, delivering biodegradable antibiotic coatings in cranial implants, and veterinary science capabilities.

After the tour, McCormick-Boyle commented not only on her appreciation of the work being done, but also on the enhanced view she now has of

the overall research, development, test and evaluation enterprise.

"This visit has really been helpful in coming to a greater appreciation of the research world than I had before I came here," she said. "I now have so much more understanding of the breadth and depth of the details of what goes on here at NAMRU-San Antonio. I've come away with not only an appreciation of the commitment of the staff, but also realizing just how much they know about their projects, and how they support the Navy and DoD medical mission."

NHRC Researchers Publish in JAMA on Military Suicide Risk Factors

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periods. This study addressed these gaps by using data from the Millennium Cohort Study, which follows a large cohort of service members from all branches of the military during and after service time.

This was the first time data from a large military population involving all

services was linked with national death records, allowing researchers to measure the relationship of risk factors during service with the long-term outcomes of suicide, even if the suicides occurred after leaving military service.

The findings from the study suggest that prevention initiatives in the

DoD and VA that address previous mental health disorders and involve screening and facilitation of high-quality treatment for mental and substance abuse disorders in primary care, specialty mental health care, and post-deployment settings have the greatest potential to mitigate suicide risk.

Navy Researchers Using MED64 to Assess Neurotoxicity

By Dr. Joyce Rohan, Dr. Vivian Vralsted and Shawn McInturf,
NAMRU-Dayton



DAYTON - The brain is a critical target of several toxins present in operational environments. In order to better

understand the effects of known or potential neurotoxins, researchers can study what happens when brain cells are exposed to these substances in a dish to measure changes to their inherent electrical activity.

The Environmental Health Effects Research Directorate at the Naval Medical Research Unit Dayton ([NAMRU-Dayton](#)) established an electrophysiological approach to investigate brain function by directly measuring neuronal activities using the MED64 microelectrode array system.

This capability complements existing neurobehavioral assays, enabling the assessment of brain function at multiple levels ranging from microscopic cellular events to readily observable behavior.



Dr. Joyce Rohan (right) explains to Lt. Cmdr. Steele, Office of Naval Research (left) MED64's ability to detect and measure neuronal activity during his visit to NAMRU-Dayton this past June.

measure evoked synaptic transmission from distinct brain regions triggered by electrical or chemical stimuli of varying strengths; induce long-term changes in the strength of synaptic transmission, which is believed to be essential for

cognitive functions.

Researchers can measure neuronal function of brain tissue collected from rats either following whole animal exposure to specific environmental conditions or during application of a chemical of interest directly onto the brain slice on the dish. Data from the MED64 system can reveal insightful information pertaining to the mechanism of action of toxins or stressors.

MED64's ability to detect and measure neuronal activity makes it a powerful tool that not only enhances the capability to perform various neurotoxicological assessments, but also provides mechanistic insight that can potentially lead to preventive strategies or therapeutic interventions to combat adverse effects induced by environmental hazards or stressors.

Currently, NAMRU-Dayton researchers are collaborating with the U.S. Air Force 711th Human Performance Wing to develop projects that will utilize MED64's capability to assess neurotoxicity at the cellular level.

Currently, NAMRU-Dayton researchers are collaborating with the U.S. Air Force 711th Human Performance Wing to develop projects that will utilize MED64's capability to assess neurotoxicity at the cellular level.

Neurons communicate through a tightly coupled chemical and electrical process called synaptic transmission or neurotransmission. The interconnectivity among these neurons forms a complex network of circuitry that translates molecular events into perceived actions as well as cognitive processes.

Using MED64, researchers can

learning and memory; and track the frequency and pattern of spontaneous synaptic activity, which is indicative of neuronal stress.

Such systematic analysis of synaptic transmission at multiple brain regions provides electrophysiological data that can serve as potential biological markers for disruptions in sensory, motor and

Cairo Laboratory Provides Training on Insecticide Resistance

From NAMRU-3 Public Affairs

CAIRO - The U.S. Naval Medical Research Unit No. 3 ([NAMRU-3](#)) serves as the World Health Organization (WHO) Eastern Mediterranean Regional Office (EMRO) reference laboratory for insecticide resistance at the biological and molecular level. The NAMRU-3 Vector Biology Research Program's Dr. Alia Zayed led a joint NAMRU-3/WHO training course on insecticide resistance (IR), May 26-30.

Building on the success of a smaller WHO-funded workshop in 2009, participants from twelve countries convened for this expanded training course. Ministries of health, agriculture entomologists and vector control specialists from Afghanistan, Djibouti, Egypt, Jordan, Morocco, Oman, Pakistan, Saudi Arabia, South Sudan, Sudan, Tunisia and Yemen attended lectures and discussions targeting IR management.

Through seminars and discussions, the trainers and the trainees learned from each other how their



Entomologists and vector control specialists from twelve African and Middle Eastern countries participate in a group discussion at the NAMRU-3/WHO training course on insecticide resistance.

in South Africa served as facilitators and consultants.

Malaria is one of the major killers in countries throughout the region, and control of the "malaria burden" is a top priority for the governments.

Malaria is one of the major killers in countries throughout the region, and control of the "malaria burden" is a top priority for the governments.

respective countries are dealing with insecticide resistance. Global experts such as Dr. Michael Macdonald with the WHO Global Malaria Program; Dr. Abdel Basset, professor of entomology from Al Azhar University, Cairo; and Dr. Basil Brooke of the National Institute for Communicable Diseases

One major target is to kill the vector of the disease. However, when a government sprays insecticides and people are still getting sick with malaria, the efforts to reduce the malaria burden are ineffective.

The IR training objectives were to reinforce knowledge on different vec-

tor control measures; elucidate the insecticide resistance mechanisms, metabolic resistance and target-site resistance; and identify and characterize malaria parasites and the blood meal source in infected mosquitoes.

The training sought to identify how to strengthen surveillance by identifying possible solutions and strategies to deal with IR. A major element includes extensive and effective communication between the entomologists and vector control people in the field and with the decision-makers in the ministries. The gap between what the entomologists and vector control people find in the field and how that is communicated and acted upon by the governments was extensively addressed.

From the Navy Surgeon General: Jointness Across Navy Medicine

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care and processes. Equally important is always to celebrate those Navy traditions and unique mission requirements that will always fall to a maritime portfolio. Our approach will be joint where possible; however, we will continue to excel and invest in those capabilities that are uniquely

inherent to Navy Medicine. I have had the honor to command Army and Air Force personnel, I have practiced in the VA hospital system, and I have seen the passion that the private sector and academic centers bring to our mission – united we will make a difference for the Warrior in combat and the family at our door. We will

celebrate our joint accomplishments and cherish our spirited traditions. (Go Navy, Beat Army!) One Team...One Fight!

I am very proud of the work you do each day. Thank you for your service and as always, it is my honor and privilege to serve as your surgeon general.

NSMRL Commanding Officer Speaks at Naval Submarine League

From NSMRL Public Affairs

GROTON, Conn. - The commanding officer of the Naval Submarine Medical Research Laboratory ([NSMRL](#)), Groton, Conn., presented a brief on NSMRL's capabilities and accomplishments at the Naval Submarine League Nautilus Chapter luncheon, July 12. The approximately 30 attendees included Rear Adm. Jerry Holland, USN (Ret.), a retired Special Forces colonel, and retired military doctors as well as several General Dynamics - Electric Boat managers and engineers.

Capt. Steven Wechsler, NSMRL commanding officer, said, "NSMRL is at the forefront of fundamental changes in submarine operations that have been in place for the past 44 years. The key to our success is the broad range of research, with the basic knowledge gained being directly applied to operational problems." He added, "NSMRL is the only DoD lab dedicated to research in submarine and diving medicine."

NSMRL currently has a Memorandum of Agreement with the Submarine Force (SUBFOR) and has been designated as the SUBFOR Human Performance Laboratory. NSMRL research areas include submariner wellness, shipboard health performance, and under-sea warfighter psychological and human factors.

NSMRL collaborators include the Submarine Development Squadron, Naval Sea Systems Command, National Aeronautic and Space Administration, Submarine Learning Center, the U.S. Army Research Institute of Environmental Medicine (USARIEM), and the Navy Experimental Diving Unit.

A 1,000 cubic meter anechoic chamber, 140 cubic meter reverberant chamber and seven audio testing booths make up NSMRL's sound facilities; three hyperbaric chambers, dodge pond (Naval Undersea Warfare Center) and dive boat make up the diving facilities.

NSMRL's accomplishments have been numerous over the years. Recently, NSMRL provided landmark guidance to enact 24-hour scheduling in SUBFOR. In doing so, circadian



Thomas Olson, Capt., USN (Ret.) of the Naval Submarine League Nautilus Chapter (right), presents Capt. Steven Wechsler, commanding officer of NSMRL (left), a print of USS SEAWOLF passing USS NAUTILUS on the Thames River. Photo provided by NSMRL.

rhythm entrainment is achieved along with enhanced watchstanding performance, improved sleep (quantity and quality), and minimization of fatigue and associated mishaps. In collaboration with USARIEM, NSMRL determined that a 92-day submarine (SSBN) patrol results in positive changes in body composition that can be attributed to the reduction in energy intake (there were no changes in total energy expenditure) and that changes observed in ghrelin and leptin may play a key role in weight gain. Ongoing NSMRL analyses will explore diet, physical activity and metabolism in detail. NSMRL research validated testing of candidate submariners at Recruit Training Command (RTC) and at Basic Enlisted Submarine School (BESS). This will allow testing to shift from BESS to RTC, earlier in the

training pipeline. By identifying and screening submariners who do not have the psychological aptitude for submarine service earlier in the accession pipeline, the Submarine Force Personnel Directorate estimates a savings of \$9.7 million annually.

The Naval Submarine League is a professional organization for submariners and submarine advocates. The league's primary mission is to promote awareness of the importance of submarines to U.S. national security, yet remain an independent authority on submarine matters so that its credibility is unquestioned and its message retains its effectiveness. The Naval Submarine League was founded and incorporated in Virginia as a non-profit organization in 1982. Today, league membership stands at about 3,500.

NMRC Medical Service Corps Officers Celebrate 66th Birthday

SILVER SPRING, Md. - The Medical Service Corps is one of the most highly diversified corps within Navy Medicine. Of the more than 3,000 Medical Service Corps officers in the Navy in the grades of Ensign to Rear Admiral, 41 are part of the Naval Medical Research Center (NMRC) Enterprise.

"MSC officers are scientists, providers and administrators. They serve not only in research facilities, but also in MTFs [medical treatment facilities], at sea, on deployments and humanitarian missions around the world," said Capt. Elizabeth Montcalm-Smith, NMRC executive officer.

During the NMRC cake cutting, Montcalm-Smith pointed out that the MSC birthday was a time to reflect on the rich history and tradition of the corps. She added that it was a time to celebrate the heritage of the MSC and reflect on the contributions made in defending the nation.

Originally called the Navy Hospital Corps in World War I, its vital role expanded during World War II as the military recognized the need for a permanent, all-officer medical category comprising individuals trained in administrative,



NMRC Executive Officer Capt. Elizabeth Montcalm-Smith and Lt. j.g. Kevin Brown cutting the cake during the MSC 66th birthday celebration. Photo by HM2 (FMF) Kyle Oldknow.



NAMRU-Dayton Executive Officer Capt. Jeffrey Andrews and Lt. Stephen Egan during the MSC 66th birthday celebration.

professional and scientific specialties. The Medical Service Corps was officially authorized by the Army-Navy Medical Service Corps Act of 1947 and signed by President Harry Truman. The MSC originally comprised four sections: Supply and Administration, Medical Allied Sciences, Optometry, and Pharmacy. The Act also authorized the creation of other sections as needed to meet the needs of the Navy.

During the Second World War, over 1,400 officers were given temporary appointments in the Hospital Corps and over 800 allied healthcare specialists and scientists were given temporary appointments as Naval Reserve officers. Some of these officers who served in the allied health fields were designated as Hospital Volunteer-Specialists.

Lt. Cmdr. Daniel J. O'Brien was appointed the head of the MSC Branch at BUMED in 1948. Legislation was enacted in 1954 to provide for the Office of the Director of the MSC and Lt. Cmdr. Willard Calkins was appointed the first MSC director September 29 of that year.

In 1965, MSC officers were authorized to command activities appropriate to the Corps; subsequently Naval Ophthalmic Support and Training Activity and Field Medical Service Schools were commanded by MSC officers. By 1975, MSC officers assumed command of Naval hospitals for the first time.

Lab Techs from Kenya Receive Training at Navy Lab in Cairo

From NAMRU-3 Public Affairs

CAIRO - Four Kenyan laboratory technicians from the U.S. Army Medical Research Unit Kenya (USAMRU-Kenya) visited the U.S. Naval Medical Research Unit No. 3 ([NAMRU-3](#)) for training late May.

Dr. Hanan El Mohammady, acting head of Bacterial and Parasitic Diseases Research Program (BPDRP), said, "NAMRU-3's collaboration with our partners in Kenya benefits all of Africa, as our research efforts complement and harmonize with each other."

The laboratory technicians received training on virological and molecular assays for influenza diagnosis in the Viral and Zoonotic Disease Research Program (VZDRP), which included cell culture, virus isolation, sequence training, molecular, respiratory, influenza, arbovirus serology, and quality assurance/quality control training. The BPDRP researchers provided *brucella* diagnostics training using enzyme-linked immunosorbent assay.

"These collaborations are representative of the jointness that NAMRU-3 and the USAMRU-Kenya lab are working to achieve on common research activities in the region," said



Kenyan trainees discuss training with VZDRP's Lt. Rozanski (right).

NAMRU-3 commanding officer Capt. Buhari Oyoyo.

USAMRU-Kenya is based in Nairobi, Kenya, and coordinates program activities including infectious disease

surveillance, outbreak response, infrastructure development and capacity building through education and training initiatives in East and Central Africa.

NAMRU-3 Researcher Provides Training on MERS-CoV in Bahrain

From NAMRU-3 Public Affairs

CAIRO - The Kingdom of Saudi Arabia currently has the largest cluster of Middle East Respiratory Syndrome Coronavirus (MERS-CoV). The Naval Support Activity-Bahrain (NSA-Bahrain) is in the Kingdom of Bahrain, which shares a border with Saudi Arabia. The mission of NSA-Bahrain is to provide operational support to U.S. and coalition forces operating throughout the U.S. Central Command area of responsibility. The Naval Branch Health Clinic-Bahrain is responsible for providing care to NSA-Bahrain, the U.S. Naval Forces Central Command, Commander Fifth Fleet, and 91 tenant commands. By enhancing surveillance efforts, conducting training, and estab-

lishing contacts to research this emerging disease, NSA-Bahrain is poised to respond to this disease threat.

In June, Lt. Cheryl Rozanski of the U.S. Naval Medical Research Unit No. 3 ([NAMRU-3](#)) visited NSA-Bahrain and provided two training sessions on standard operating procedures for sampling, storage and shipment of suspected MERS-CoV patient cases to NAMRU-3. Over 35 active duty and civilians were at the Naval Branch Health Clinic Bahrain at the first session; over 20 active duty from Fifth Fleet and tenant commands attended the second session, including the Surgeon and Deputy Surgeon of the Fifth Fleet and other representatives from ships and forward-deployed tenant

commands. The current NAMRU-3 standard operating procedures and case report form for MERS-CoV were explained in detail.

Rozanski also provided a "starter kit" of supplies, which included shipping containers, nasopharyngeal swabs and other supplies to maintain testing capacity and ship samples to NAMRU-3.

NAMRU-3 stands ready to test any suspected samples. Turn-around time for sample testing will be 48 hours upon sample receipt, reporting back to the installations on patient diagnostics. One significant concern is maintaining the cold chain in the fleet and at the tenant commands, which is being accomplished by utilizing different sampling techniques and storage.

The BUMED Individual Awards for Excellence: Cheryl Carr

SILVER SPRING, Md. - Cheryl Carr was selected as the 2012 Civilian Comptroller of the Year within the Navy Medicine enterprise. She primarily supports the Naval Medical Research Center (NMRC) headquarters and oversees the eight subordinate labs. Along with being the comptroller for the command, she is also the director for resources and supports the science directors here at NMRC.

With this being her first time selected for the award, Carr thought it was well deserved considering the complexity of research and development. "I thought of this award as a small victory for the R&D mission. It is recognition of the complexity of the research command and all the different appropriations and competitive research that we do," she said.

To be considered for this award, Carr had to be nominated by someone within her command. She was surprised, but also expressed honor that she was personally selected.

When informed of Carr's selection as civilian comptroller of the year, Dr. Stephen Walz, Director of Field Lab Operations for NMRC said, "This award could not have gone to a more deserving person. As the NMRC

Comptroller, Cheryl Carr manages what is probably the most complex financial operation in all of Navy Medicine. It is truly gratifying that Mr. Marshall has recognized her hard work and dedicated service."

Carr expressed that she wants to share this recognition across the enterprise. "No person's an island and you have to rely on everyone to work together, from the financial managers to the science directors, that we all come together to execute our projects and support the warfighter."

One of the things that people can do to help the process of planning and implementation is to have proper documentation prepared so the command maintains audit readiness. Excellent communication between departments and from the subordinate command level is also necessary. Everyone plays a role in the process, whether they are in resources or are an end user as a primary investigator.

A challenge the finance department is facing this year is the implementation of the sequestration and having to make cuts in management support dollars. Carr said that the outlook for fiscal year 2014 is going to be an environment of cuts and fewer opportuni-



Cheryl Carr, 2012 Civilian Comptroller of the Year.

ties available to compete for the science and research side.

"We won't know the full impact, whether it is a cut in our top line research dollars, there will be less money to compete for and our administrative funds have already seen some reduction and we'll be faced with challenging times ahead," Carr said.

NHRC's Changes of Command - Utz to Boswell to Rychnovsky

(Continued from [page 7](#))

Guests included former NHRC commanding officers Capt. (ret) Larry Dean, MSC, USN, and Capt. (ret) Mitchell Dukovich, MSC, USN, as well as former NHRC technical director Dr. Steve Nice. Also in attendance were the commanding and executive officers from Naval Hospital Twentynine Palms, Capt. Jay Sourbeer, MC, USN, and Capt. Angie Nimmo; the commanding officer from Naval Hospital Bremerton, Capt. Christopher Culp; the residency director at Naval Medical Center San Diego Pediatrics, Capt. Christine Johnson; the pediatric pulmonologist from NMC San Diego, Capt. Jeff Cleary; and dean of the Hahn School of Nursing and Health Science at the University of San Diego, Dr. Sally Brosz Hardin.



Capt. Jacqueline Rychnovsky and Capt. Lanny Boswell (front row, second and third from left) pose with members of NHRC's military staff.

Partnership Demonstrates Vaccine Protects Against Malaria

(Continued from [page 3](#))

includes over 100 countries spanning the tropical and subtropical regions of the world, including most of sub-Saharan Africa and larger regions of South Asia, Southeast Asia, Oceania, Central Asia, the Middle East, Central and South America and the Caribbean.

"We need an effective vaccine against malaria, which has been a constant threat to military personnel," said Nathan. "Our naval forces may be deployed on short notice to regions where malaria presents a leading

infectious disease threat to mission success. In our military population, malaria infection can severely degrade performance, result in missed duty, may require prolonged hospitalization and, in some cases, result in death. The news that NMRC researchers have participated in the first trial which demonstrates 100 percent protective efficacy of a candidate vaccine for malaria brings new hope that a malaria vaccine may become available for military personnel deployed abroad. I look forward to the next developments in this ground-breaking

research."

NMRC collaborated with federal researchers from the Vaccine Research Center Clinical Trials Core at the National Institutes of Health Clinical Center, the Walter Reed Army Institute of Research and the vaccine developer Sanaria, Inc., Rockville, Md. NMRC participated in the development of the protocol, provided malaria microscopists and slide-reading assistance, performed cellular assays, and assisted with the care of volunteers during the inpatient post-challenge stay.

Greetings from the NMRC Ombudsman!

Since much of the work at NMRC is focused on vaccine development, I probably don't have to spend much time dwelling on the importance of immunization. But did you know that August is National Immunization Awareness month?

Although most of us know how important it is to get vaccinated, not everyone does and now is the time to get the word out! Remember, immunizations are not just for newborns; a healthy vaccination schedule follows individuals throughout their lifetime, from one's first immunizations as a newborn to pre-teens' vaccinations, those that we receive before going off to college and the vaccinations we receive annually as adults. Are you and your family up-to-date on your immunizations? With a new school year approaching, now might be a good time to review the recommended vaccination schedule and see to it that you, your family and our community are protected.

If you have questions about what vaccinations you and your family need, a good place to start is the immunization website hosted by the CDC. I've posted various links to immunization schedules by age group below.

- Infants and children (birth through 6 years old): <http://www.cdc.gov/vaccines/schedules/easy-to-read/child.html>
- Preteens and teens (7 through 18 years old): <http://www.cdc.gov/vaccines/schedules/easy-to-read/preteen-teen.html>
- Adults (19 years and older): <http://www.cdc.gov/vaccines/schedules/easy-to-read/adult.html>

As a native Spanish speaker, I'd be remiss if I didn't mention that these links also have Spanish-language resources!

If you still have questions about which vaccinations you and your family may need, contact your primary care provider.

On another note, with fall approaching I'm reminded that many of you have children going back to school. Some of you may even have children starting school for the first time or going to a new school, maybe because of a recent PCS. Preparing for school can be stressful for parents and children alike. As I wrote in a previous newsletter, military life can add an extra layer of stress on families and children when it comes to school. Frequent moves and the absence of one parent or another due to deployment can conspire to undermine a child's performance in school. Recognizing the challenges that military kids can face, resources have been developed to help them achieve their full potential. A couple of these resources are <http://www.militarychild.org/> and <https://militarykidsconnect.org/>.

As always, if you have questions about back-to-school resources, immunizations or other topics, please don't hesitate to contact me!

Finally, I'd like to take this opportunity to extend a special welcome to our displaced colleagues from NAMRU-3! In these transitional times, the NMRC community is here to assist you in any way we can. If you need assistance during your stay in the greater D.C. area, please let me know.

As always, if you are in search of other resources or assistance, please don't hesitate to contact me. I can be reached by phone at 301-233-9789 or by email at NMRC.Ombudsman@gmail.com.

Enjoy the rest of your summer!
Alexandra Mora, NMRC Ombudsman